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The Next Great Transition

Preparing for the new POWER7 processor-based server line

February 2010 | by [Jaqui Lynch](#)

On Feb. 8, IBM announced another major step in the roadmap for the Power Systems servers. In the announcement, they provided details on the new POWER7 processor-based line of servers and some new software announcements. Adding a POWER7 processor-based server to your IT center can be simple, with these data-center preparation tips.

The four servers announced are the Power 750, Power 755, Power 770 and Power 780. The 750 and 755 are both 4U servers while the 770 and 780 are modular node-based systems (4U per node) that are built and linked together in a similar fashion to the POWER6 processor-based Power 570 servers. All of the new Power servers take advantage of the new features in the POWER7 chips. Some features were announced as being available immediately, whilst others will be merged into the product line in the next six months. It's critical the configurations be correct, as there will be no upgrade (MES) functions available in the configurator until April, and those upgrades won't ship until June. Solutions-assurance reviews should be completed on all POWER7 processor-based servers to avoid waiting for upgrades if something is forgotten.

The Power 770 and 780 by default include some features that clients have been requesting. For instance, the backplane on each node is now split into two sets of three disks and the media is floated. You no longer need to add cards in order to support internal VIO (virtual I/O) server disks. Thus, all of the slots are now available for client LPAR use. This should be factored into planning data sheets. For the Power 750 this isn't the case; the backplane isn't split by default and customers will still need to add a card and cable to perform that split. Be aware that splitting the backplane on the 750 means you can't attach a 5886 I/O drawer to the serial-attached SCSI (SAS) external port. The Power 755 doesn't have a split backplane option and has no virtualization capability, as it's designed as a high-performance computing (HPC) node. Additionally, it's now possible to use the built-in serial ports and USB ports on the Power 770 and 780. The 750 has two PCI-X and three PCI-E slots, whereas each node on the 770 and 780 has six PCI-E slots. There are no PCI-X slots on the Power 770 or 780. This means customers should plan to move any PCI-X cards to I/O drawers that support PCI-X and that are supported on POWER7.

Planning for new POWER7 Servers

It should be noted that all servers require 200-volt power. There will be no 110-volt options on the Power 750 through 780, so power options in the data center need to be planned accordingly. Additionally, the cable that connects the Power 780 nodes together is a thicker cable and has specific rack requirements. On the 7014-T42 racks, a thin trim kit is required and it's also possible a new door may be required for the Power 780; more details on this will

be available shortly. The mandatory technical delivery assurance (TDA) on the Power 770 and 780 will provide details on the exact features that will need to be ordered. Non-IBM racks will need to be checked to ensure they meet the requirements for these cables. All four servers will go into 19-inch racks and will have very close to the same power-distribution unit (PDU), cooling and power requirements as the current POWER6 processor-based servers; additional details are in the solutions assurance documents.

The Power 770 and higher mandate a HMC, and all of the POWER7 processor-based servers will require a HMC that is a model CR3 or C05 or higher. Additionally, should you need to run a significant number of LPARs or to have IBM Systems Director integrate with the HMC in the future, then it's recommended those HMCs be upgraded by adding 2GB of memory to bring them up to 3GB. The most recent HMCs (CR5 & C07) have 4GB of memory and won't require upgrades. I normally configure any HMC with at least 3GB of memory, as it improves performance when you have multiple HMC users on the system. It's an inexpensive upgrade and is well worth putting in place. If HMCs are older than the CR3, they'll need to be replaced with more recent HMCs in order to support the POWER7 processor-based server line. Additionally, the HMC must be running v7r710 of the HMC software, at a minimum. Keep in mind when the HMC is upgraded (including the software) it's important to check the matrix that shows minimum firmware and operating system versions for any servers currently attached to that HMC; this will help avoid problems.

From POWER6 to POWER7

All of the planning items mentioned above apply, plus there are some unique things about planning for upgrades. The first thing I would note is: You must make sure your firmware on the servers to be upgraded is current. This means cross checking with disk subsystems, multipath I/O (MPIO) drivers, operating systems, HMC versions, and VIOS versions to ensure they are all at the minimum levels and they can coexist. This will make for a much smoother upgrade with minimal risk.

The POWER7 processor-based servers won't support RIO drawers, so any server being upgraded to POWER7 processor-based servers will need to either migrate to 12X drawers beforehand or will need to replace those RIO drawers at the time of the upgrade. Additionally, when migrating to a Power 770 or 780, any PCI-X cards will need to be moved to external 12X drawers that support PCI-X prior to the upgrade or they will need to be replaced with PCI-E equivalents. The Power 770 and 780 support small form factor (SFF) drives, so any 3.5-inch drives will need to be moved to external drawers if you want to keep them. Initially, the 5886 and 7314-g40 I/O drawers won't be supported; however, this support will be forthcoming in April, so plan accordingly if you need to support these drawers.

Software Requirements

In order to run on the POWER7 processor-based servers there are specific requirements for software versions, including:

- AIX v5.3 TL11 SP2
- AIX v6.1 TL04 SP3 (to run in p7 mode) otherwise 6.1 TL02
- The Power 770 and 780 will require AIX v6.1 TL04 SP3
- IBM i 6.1 with 6.1.1
- VIOS 2.1.2.12 FP22.1 and SP2 (2.1.2.11 for 750, 2.1.2.15 for 770/780)
- SUSE Linux Enterprise Server (SLES) 10 with SP3 or SLES11
- Red Hat Enterprise Linux (RHEL) 5.5 SOD is GA 3/10

Full POWER7 enablement will be provided with AIX v6 TL05 and AIX v5.3 TL12, which are expected to come out in April. Service packs for older technology levels for AIX v6.1

(TL2 and TL3) won't be available until June and the AIX v5.3 service packs for TL9 and TL10 will not be available till May.

You should also start migrating LPARs to AIX v6.1. While AIX v5.3 will run on POWER7 processor-based servers, it won't run in POWER7 mode. This means many of the new features that come with POWER7, like SMT4, won't be available to AIX v5.3 LPARs. Published rPerf numbers are for POWER7 processor-based servers running in POWER7 mode (i.e. SMT4) so plan accordingly if you plan to run LPARs in POWER6 compatibility mode. Additionally, with AIX v7 coming later this year AIX v5.3 will be withdrawn. So, it's time to start the transition to better position yourself for the upcoming new features. It was also very clear from the announcements that there is a huge focus on Systems Director as the management tool of choice. Systems Director will now be shipped with all new systems, so I would highly recommend you take the time now to familiarize yourself with this tool and the wealth of plug ins available for Power Systems servers.

Get Ready

POWER7 processor-based servers are rolling out as I write this, so there's no better time for you to conduct a readiness assessment. Even if you don't plan to go to the new Power servers immediately, this is a good time to start putting any infrastructure upgrades in place to ensure the transition is orderly and that POWER7 processor-based servers integrate smoothly into your environment. Make a list of the current levels of your install base and start the migration of those LPARs and their supported infrastructures to the latest supported releases. This is an exciting rollout and you want to be well positioned to take advantage of it.

Finally, do not rule out POWER6 processors; the coordinating server line is a great product and will be around for a while. If you're not quite ready to transition to POWER7 processor-based servers, then continue with new POWER6 processor-based boxes; just ensure they meet the specifications that allow you to upgrade them later.

Now is the time to get serious about Power Systems. These are great products and with a little planning, your upgrade (or new) experiences will be extremely positive.

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